1-1-1899

The selection of milch cows

A. C. Magruder.

BULLETIN NO. 5.

OF THE

WEST VIRGINIA

AGRICULTURAL EXPERIMENT STATION,

AT

MORGANTOWN, W. VA.

JUNE, 1889.

"THE SELECTION OF MILCH COWS."

BY A. C. MAGRUDER.

JOHN A. MYERS, Director.

CHARLESTON:
MOSES W. DONNALLY, PUBLIC PRINTER.
1889

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THE SELECTION OF MILCH COWS.

On the selection of milch cows depends largely the success or failure of those engaged in dairy farming. Before buying a cow, we must know exactly for what purpose she is to be used. To produce milk for butter, to produce milk for cheese, or to produce milk for sale as milk. The above are three distinct classes, and fortunately there are cows in this State to fit each class.

If the object is to supply milk to creameries, it is to the owner's advantage to procure cows that will yield milk rich in fat. "Quality rather than quantity" being considered. If the object be to supply milk to a cheese factory, milk rich in casein or cheesy matter should be sought, and quantity as well as quality should be considered. If the object be the delivery of milk to private consumers, it is desirable to keep well up to the standard of good milk, which by analysis is found to be :

Water	87 5 per cent.
Fat	3.4 per cent.
Ash	.7 per cent.
Casein	3.9 per cent.
Sugar	4.5 per cent.
Total	100. per cent.

The object of this bulletin, however, is to deal principally with the selection of cows for supplying milk to creameries, where butter is the main product of manufacture.

No one will deny the statement that it costs no more to keep a good cow than to keep a poorer one. We would strive to impress upon the minds of the farmers the superior value of good, over bad cows, and to that end is given points to guide in the selection of the best.

There are no set rules to be followed in the selection of a butter cow, but a combination of good points is to be looked for that shows the capacity of the animal for producing milk rich in fat. In working with the native cattle of our country, there exists two serious difficulties.

1st. The average low capacity for yield in butter.

2nd. The uncertainty of results in selecting stock that has never been tried.

The fact that "like produces like" is well known. In standard breeds of dairy stock, where both sire and dam are from a strain of fine milkers, we seldom fail to procure a good cow, but with the native cattle no reliance can be placed on either sire or dam, as the bad qualities of ancestors may appear in the offspring at any time The above difficulties, though radical, can be overcome in part by a few years of careful selection and breeding. It will take much time to rear a good dairy herd, and even then, there is not the absolute certainty of producing good milkers as there is in the old and well established breeds. To purchase a thoroughbred herd of cattle is out of the reach of many of our farmers. In the absence of the thoroughbred, however, the next best method to be pursued is to procure a thoroughbred male of the breed decided upon as best for the purpose intended, and by a system of proper selection, and grading from the native cow, a fair line of milk and butter cows can be produced. We are dependent upon the native stock of the country, and by proper and judicious handling of these we believe more profit can be realized than from the sale of the usual standard crops, sheep, or beef cattle.

In the selection of milch cows, as has been said, no definite criteria can be given, but good cows possess certain points that seldom lead one astray, and the greater number of points that can be found combined will indicate with more certainty the capacity of the animal at the pail.

Points Usually Possessed by Good Milch Cows.

First, and of prime importance is that she should be descended from a line of good milkers. Head, small; muzzle, fine; nostrils, flexible and expanded; face, long, slender and dishing; mouth, large; lips, thick and mild in expression; horns, of any shape, delicate and waxy; ears, long and thin with a few soft, silky hairs on inside where skin is of a decided yellowish color; neck, thin and small where it joins head; chest, deep, indicating well formed respiratory organs; back, broad and level; belly, large and well ribbed; low flank; thigh, wide but thin; legs, short, standing well apart; large milk veins; udder, loose, large, soft, pliable, square in form, or nearly so, projecting well out behind the legs; four good teats not too large, set wide apart and pointing slightly outward; skin, loose and mellow, and of yellowish color; hair, fine, thick and glossy; disposition, quiet; milk-mirror or escutcheon (explained further on) well marked, being free from patches or tufts of down-growing hair.

No two men of a section rarely ever decide upon the best breed of stock for the dariy, unless the two are accustomed to handling the same. We are apt to consider best that which we have the longest used and to what we are most accustomed. To name the breed that would be most remunerative to farmers of the differ-

ent sections of this State would be impossible, because too many points of difference exist in the different parts of the State. The pasture that would keep well one breed might not half keep another. Small cows can travel over much more steep and rough ground than can larger ones, and if pasture is scant, the smaller cow would stand the better chance of obtaining more food.

Large cattle are bred where there is an abundance of good food, and they require it wherever they are kept or they will decline. Smaller cattle, accustomed to more moderate fare, do well on moderate pasture. "Stock should be transplanted from good to poor land no more than should trees."

Explanation of Escutcheon or Milk-Mirror.

In the selection of milch cows, no part of the body offers surer signs of the animal's capacity at the pail than does the escutcheon or milk mirror, and adjoining parts.

Guenon, a Frenchman, was the first to notice the connection of the milk-producing organs with "certain external marks on the udder and parts above it, or prenium, extending in some cases, as far up as the vulva, as low down as the hocks and spreading to a greater or less extent out on the buttock." These external marks were given the name of escutcheon or milk-mirror. They are known by the hair upon them growing in an upward direction, while that of the rest of the body grows downward.

There are many different forms of escutcheon, and each has its special significance. Guenon first classified them in such a way, giving the value of each form and size, that he could, by simply looking at the escutcheon, tell the capacity of the animal, the quality of the product, and the length of time she would remain in milk. His classification, however, which consists of more than seventy classes, sub-class, etc., is entirely too complicated to be used to advantage and it has been discarded by many of the most learned as too tedious and complicated for general use.

While the escutcheon is almost a correct guide, there are exceptions where cows with scarcely perceptible escutcheons are fairly good milkers, and also cows with well developed escutcheons, covering a great amount of surface, are poor milkers.

The milk vessels are found beneath the upturned hair about the udder; hence, the greater number of milk veins, the greater the extent of upturned hair, and *vice versa;* the larger the escutcheon the greater the number of milk veins; hence the greater the yield of milk. In other words, as the veins are beneath the escutcheon, we judge their number by the extent of the escutcheon. The escutcheon is usually determined by a perceptible ridge formed by the meeting of the hair growing in different directions. When not

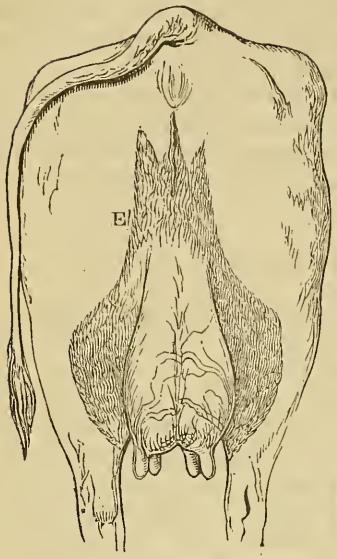


Fig. 33.

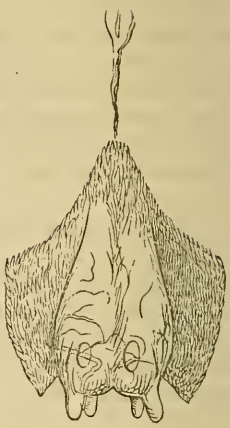


Fig. 34.

Fig. 36.

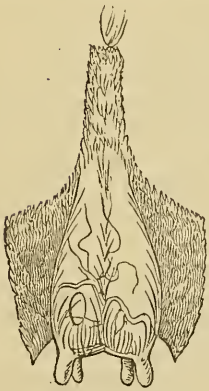


Fig. 35.

Fig. 37.

easily determined thus, the animal may be made to walk a few steps forward when the escutcheon may be outlined by different reflections of light upon the parts. If this fails, the finger's end may be run over the parts, and when the nails come in contact with the hair growing in the opposite direction from the way the hand is

being drawn, it will determine the position of the escutcheon by raising the hair growing in the opposite direction from the moving hand.

Fat covers many faults, and care is to be exercised in examining escutcheon as to the condition of fat of the perineum; and also the fullness of the udder; as a fat cow, or a distended udder shows a larger escutcheon than there really is.

By Flint, there is a division of the escutcheon into upper and lower tufts. The upper tufts are small in comparison with the lower. and are set in close proximity to the vulva, as seen at "S," Figs 38, 39 and 40. These tufts appear on cows belonging to poor milk stock, but are seldom seen on good milch cows. The tufts consist of small parts of upturned hair, and show the continuation of flow of milk. The larger these tufts are, the shorter the milking period. These tufts are not escutcheon, and are easily distinguished by the bands of hair, as shown in Figs. 38 and 40. The lower tufts are divided into two parts. 1st. Mammary, or the part covering the milk glands, thigh and legs. 2nd. The perinean, or the part extending over the perenium proper. The class fication of Magne seems the most simple and accurate. As we have it from Flint, he divides all cows into four classes follows:

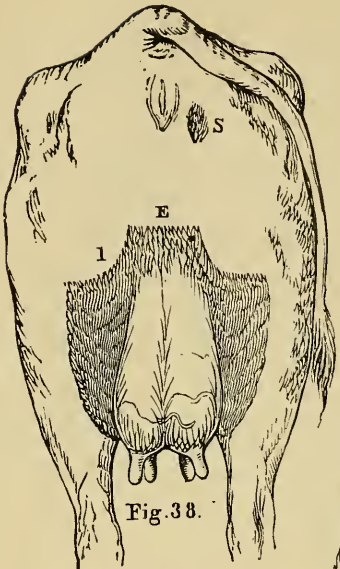


Fig. 38.

Fig. 39.

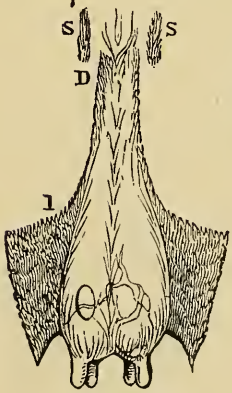


Fig. 40.

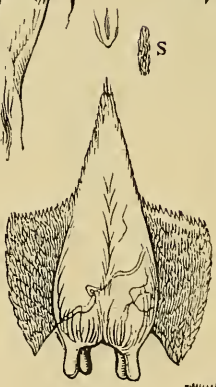


Fig. 41.

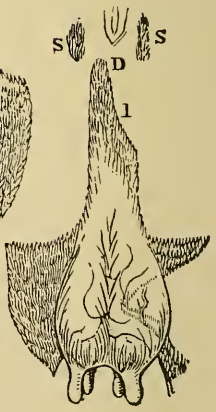


Fig. 42.

1st, very good ; 2nd, good ; 3rd, medium ; 4th, bad.

In the first-class is placed cows both parts of whose milk mirror, the mammary and perinean, are large, continuous and uniform, covering at least a great part of the perineum, the udder, the inner surface of the thighs, and extending more or less out upon the legs, as in Fig. 33, with no interruption, or if any, small ones which are oval in form, and situated on the posterior face of the udder, Figs. 33 and 35.

Such mirrors are found on most very good cows, but may also be found on cows which can scarcely be called good, and which should be ranked in the next class. But cows, whether having very well developed mirrors or not, may be reckoned as very good, and as giving as much milk as is to be expected from their size, feed, and the hygienic circumstances in which they are kept, if they present the following characteristics :

Veins of the perineum, large and if swollen, and visible on the exterior, as in Figs. 35, 38, or which can be easily made to appear by pressing upon the base of the perineum ; veins of the udder, large and knotted, milk-veins large, often double, equal on both sides, and forming zig-zag under the belly.

To the signs furnished by the veins and by the mirror may be added also the following marks :

A uniform, very large and yielding udder, shrinking much in

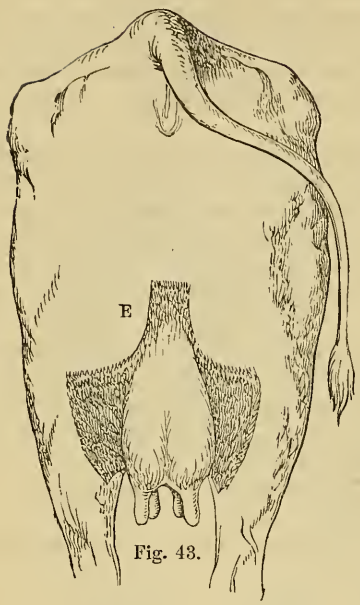


Fig. 43.

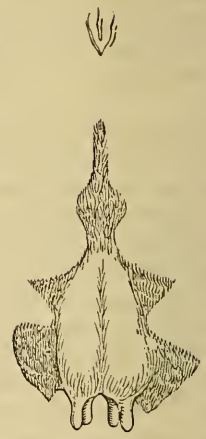


Fig. 44.

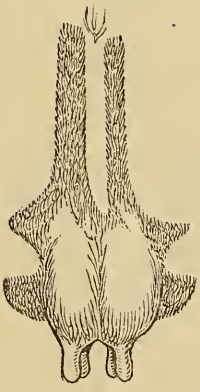


Fig. 45.

Fig. 46.

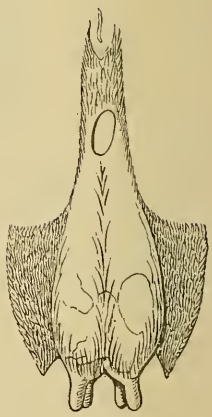


Fig. 47.

milking, and covered with soft skin and fine hair; good constitution, full chest, regular appetite and great propensity to drink. Cows rather inclining to be poor than fat. Soft, yielding skin, short, fine hair, small head, fine horns, bright sparkling eye, mild expression, feminine look, with a fine neck.

Cows of the first class are very rare. They give, even when small in size, from ten to fourteen quarts of milk a day, and the largest sized from eighteen to twenty-six quarts a day, and even more. Just after calving, if arrived at maturity and fed with good, wholesome, moist food in sufficient quantity and quality, adapted to promote the secretion of milk, they can give about a pint of milk for every ten ounces of hay, or its equivalent, which they eat.

They continue in milk for a long period. The best never go dry, and may be milked even up to the time of calving, giving from eight to twelve quarts of milk a day. But even the best cows often fall short of the quantity of milk they are able to give, from being fed on food that is too dry, or not sufficiently varied, or not rich enough in nutritive qualities, or deficient in quantity.

The second class is that of good cows, and to this belong the best commonly found in the market and among the cow-feeders of cities

They have the mammary part of the milk-mirror well developed, but the perinean part contracted or wholly wanting, as in Figs. 34 and 37; or both parts of the mirror moderately developed, or slightly indented, as Figs. 35 and 36. Figs. 38, 39, 40 and 41 belong also to this class in the lower part; but they denote cows which, as upper mirrors, S S S, indicate, dry up sooner when again in calf.

These marks, though often seen on many good cows should be considered as certain only when the veins of the perineum, form

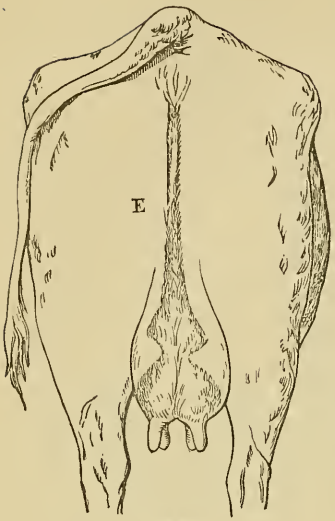


Fig.48.

Fig.49.

Fig.50.

Fig.51.

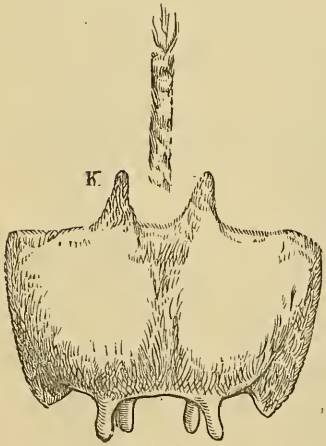


Fig.52.

Fig.53.

under the skin a kind of network, which, without being very apparent, may be felt by a pressure on them; when the milk veins on the belly are well developed though less knotted and less prominent than in cows of the first class; in fine, when the udder is well developed, and presents veins which are sufficiently numerous, though not very large.

It is necessary, then, as in the preceding class, tohave a mistrust of cows in which the mirror is not accompanied by large veins. This remark applies especially to cows which have had several calves, and are in full milk. They are medium or bad, let the milk mirror be what it may, if the veins of the belly are not large, and those of the udder, apparent.

Small cows of this class give from seven to ten or eleven quarts of milk a day, and the largest from thirteen to seventeen quarts. They can be made to give three-fourths of a pint of milk, just after calving for every ten ounces of hay consumed, if well cared for and fed in a manner favorable to the secretion of milk. They hold out long in milk when they have no upper mirrors or tufts. At seven or eight months in calf, they may give from five to eight quarts a day.

The third class consists of middling cows. When the milk mirror really presents only the lower or mammary part slightly developed or indented, and the perinean part contracted, narrow and irregular, as in Figs. 42 to 47, the cows are middling. The udder is slightly developed or hard, and shrinks very little after milking.

The veins of the perineum are not apparent, and those which run along the lower sides of the abdomen are small, straight and sometimes unequal. In this case, the mirror is not symmetrical, and the cow gives more milk on the side where the vein is largest.

These cows often have large heads, and a thick and hard skin. Being ordinarily in good condition, and even fat, they are beautiful to look at, and seem to be well formed.

Cows of this class give, according to size, from three or four to ten quarts of milk. They very rarely give, even in the most favorable circumstances, half a pint for every ten ounces of hay which they consume. The milk diminishes rapidly and dries up wholly the fourth or fifth month in calf.

The fourth-class is composed of bad cows. As they are ordinarily in good condition, these cows are often the most beautiful of the herd and in the markets. They have fleshy thighs, thick and hard skin, a large and coarse neck and head, and horns large at the base.

The udder is hard, small and fleshy, with a skin covered with long, rough hair. No veins are to be seen either on the perineum or the udder, while those of the belly are very slightly developed, and the mirrors are ordinarily small, as in Figs. 48, 49 and 50.

With these characteristics, cows give only a few quarts of milk a day, and dry up a short time after calving. Some such can scarcely

nourish their calves, even when they are well cared for and well fed.

The escutcheon will be found developed partly on all cattle, and it is found extremely valuable in judging young heifers intended for the dairy, or males to be used in grading the herd.

In bulls the escutcheons are always smaller, but are classified as they are in cows.

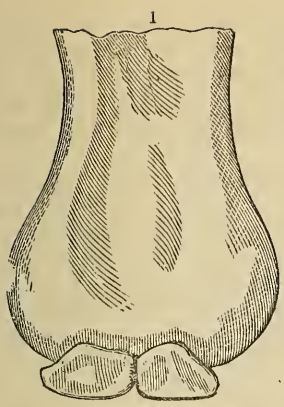
The escutcheon will be found formed on calves at birth, and in judging calves or heifers, the foregoing remarks will apply to them. It is needless to say that the size of the animal must in all cases be an important point to consider.

Methods Used in Determining Age of Cattle.

One of the most necessary attainments of a good judge of live stock is to be able to determine the age of animals. With dairy cows, the age is quite an important point to be considered, for one does not care to purchase a cow whose capacity for secreting milk is decreasing. The cow is considered to have reached the prime of life at about ten years of age, and from that time there is usually a falling off in the milk supply. This rule, however, is not universal; for cows well kept have been known to give their usual quantity of milk in the fifteenth year.

Quite a customary way of determining the age of cattle is by means of rings which are formed annually on the horns. These rings are not correct guides at all ages, but may indicate approximately the age between the third and tenth years. The horn is perfectly smooth until the third year, when a ring is formed at its base. A ring thereafter occurs annually, and by adding two years to the number of rings upon the horn, the age may be determined. The above is the case when the formation of rings has been uniform, but so liable are these formations to abnormal growths that no accurate dependence can be placed upon the system.

The teeth, however, afford the most accurate means within our possessession of determing the age where no record has been preserved. The calf at birth, or soon after, has two front teeth, termed nippers, first middle teeth, or incisors, as shown in plate 1. In two weeks after birth, a tooth has appeared on each side of the middle teeth already formed. These are termed second middle



1

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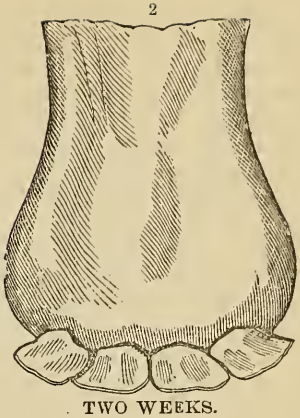

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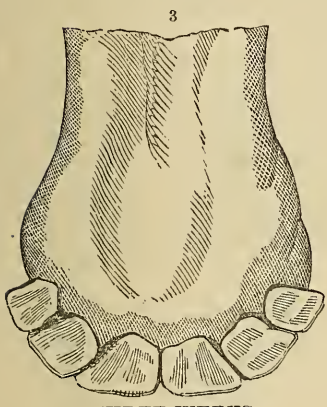
TWO WEEKS.



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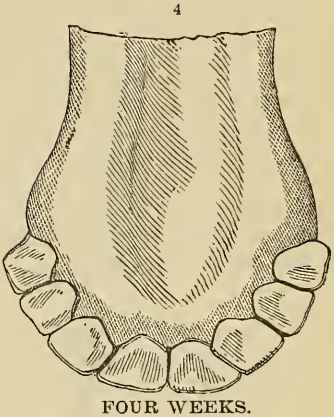
THREE WEEKS.



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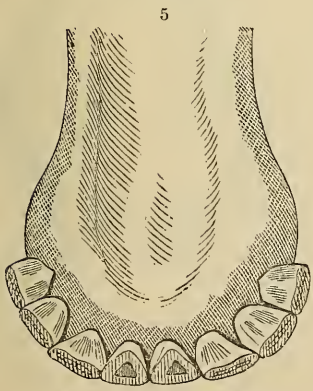
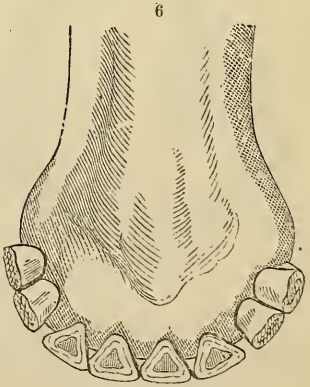
FOUR WEEKS.



5

FIVE TO EIGHT MONTHS.



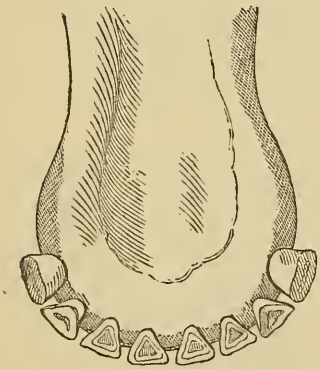
6

TEN MONTHS.

teeth (plate 2) and during the third week, there appears a tooth on each side of the last teeth formed (plate 3) and by the fourth week, usually, the mouth is full, as shown in plate four. These teeth of the first month are not permanent, but are very soft, and are gradually worn off and absorbed to give place to the formation of a new and permanent set.

After the calf has attained age sufficient to admit of partaking solid food, the teeth begin to wear off very rapidly, and the amount of wearing indicates the length of time they have been used. It will be found that the center pair of the first teeth that appeared are the first to begin to wear, the wearing beginning on the inner line of the teeth. In many cases, the wearing has begun before the appearance of the last pair of temporary teeth. From six to eight weeks old, the teeth still remain sharp upon the outer edge. The wearing extends gradually outward from the center pair, and at about the age of four months, the entire set is worn so that it presents a decidedly flat appearance. The center being flattened more than the outer. After the age of four months, a shrinkage or absorption of the teeth sets in and they are diminished in size, thus becoming separated, as well as becoming more and more flattened. From five to eight months of age, the teeth appear as in Plate 5, while in plate 6, may be seen the representation of the teeth at ten months. At twelve months or a year, the teeth are much smaller, are still contracting, and are worn down, as shown in plate 7. At the age of fifteen months (plate 8) the outer teeth are worn to one-half their size, while the inner are still smaller.

7



ONE YEAR.

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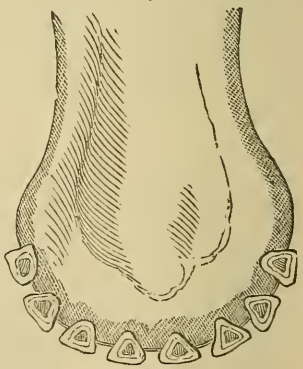

FIFTEEN MONTHS.

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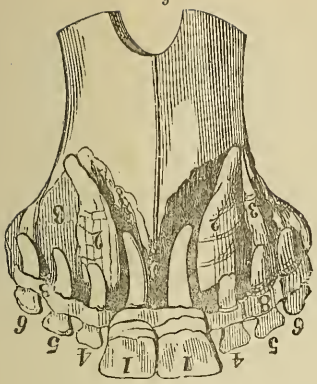
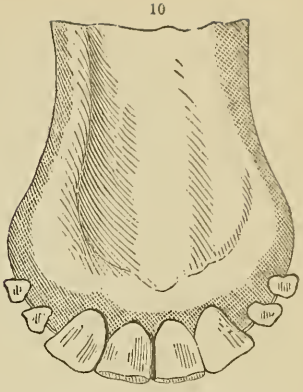


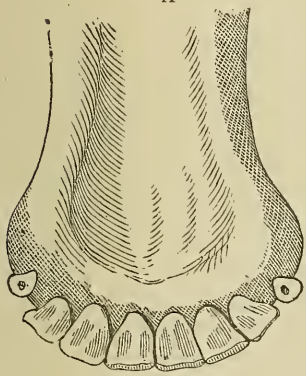
EIGHTEEN MONTHS.

10



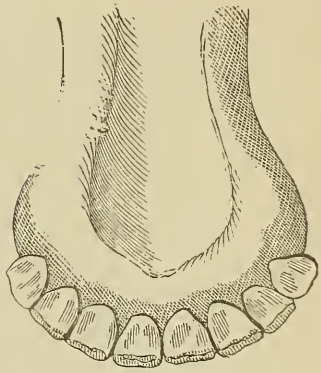
TWENTY-FOUR MONTHS.

11



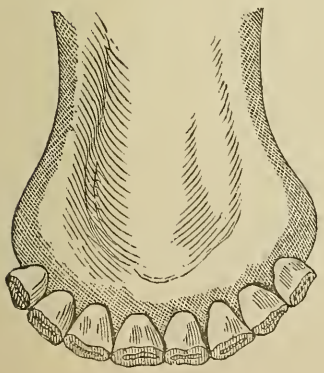
THREE YEARS.

12



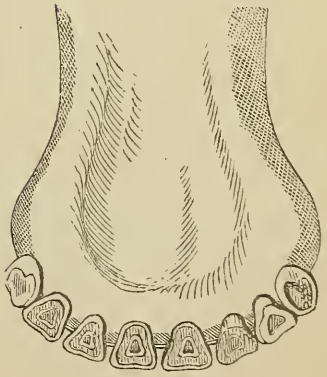
FOUR YEARS.

13



FIVE TO SEVEN YEARS

14



TEN YEARS.

During the time occupied in the shrinking of the first set of teeth, the permanent ones have been slowly growing, and as the first pair that appeared in the mouth are absorbed or pushed out, a second, but permanent pair, appears in the place of the first, and are known as the first pair of permanent incisors. A representation of the mouth at this period is shown in plate 9. "This plate also represents the internal structure of the lower jaw-bone, and the process of the formation of teeth. Fig. 1. on the plate represents the first pair of permanent teeth appearing in the mouth. Fig. 2, the second pair about to push through the gum. Fig. 3, the third pair just forming." At twenty months, two pairs of teeth are in the mouth, while at two years the mouth appears as shown in plate 10. The growing of the third and fourth pair of teeth require one year each, while the same time is required for the third and fourth pair of temporary or milk teeth to become absorbed or pushed out. At three years the teeth are represented in plate 11, while at four years all of the teeth have made their appearance, and the mouth is full. At three years of age it will be noticed by the plate that the teeth have begun to wear off. At four years the wearing has extended to the second pair of teeth, while in the fifth year the three middle pair of teeth are worn down so that a dark line appears at the center of the first middle pair along the line of harder bone structure. The fourth or last pair of teeth at this age are worn slightly. From five until seven years no decided changes occur, and we are only to be guided by the extent to which the dark line has advanced in the outer teeth. The line may be very decided, and easily seen, or it may be so dim that it requires care to detect it. At seven years the line will usually be found to have extended across the entire set, but this depends upon the character of food, care, etc., to which the animals have been accustomed.

The shrinking or absorption that took place with the temporary teeth takes place also with the permanent set, but much more slowly, and at eight years, the first or middle pair of permanent teeth have contracted so that they are decidedly smaller than the others. In the tenth year, this contraction is extended to the third pair of teeth, and the dark line becomes less visible. At twelve, the whole set is smaller than formerly, while the dark lines are very indistinct in all but the last or corner teeth. Beyond this point, there is no certainty, but the wearing continues until the teeth are worn down to the gums.

NOTE.—The cuts used in illustrating this Bulletin and also parts of explanation thereof are taken from Chas. L. Flint's work on "Milch cows and Dairy Farming," published by Messrs. Lee & Shepherd, of Boston, Mass., to whom I am indebted for the loan of the plates.